

FCC 47 CFR PART 15 SUBPART C

CERTIFICATION TEST REPORT

For

37 inch Bluetooth Soundbar with Wireless Subwoofer

MODEL No.: MSB3787W, SBB-91460, SBB-XXXX(XXXX where X can be 0-9,
A-Z)

FCC ID: OKUSBB91460

Trade Mark: Monster



REPORT NO.: ES190925014W02

ISSUE DATE: November 05, 2019

Prepared for

SHENZHEN JUNLAN ELECTRONIC LTD

No.277 PingKui Road, Shijing Community, Pingshan Street, Pingshan New
District, Shenzhen, China

Prepared by

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1 TEST RESULT CERTIFICATION

Applicant: SHENZHEN JUNLAN ELECTRONIC LTD
No.277 PingKui Road, Shijing Community, Pingshan Street, Pingshan New District,
Shenzhen, China

Manufacturer: SHENZHEN JUNLAN ELECTRONIC LTD
No.277 PingKui Road, Shijing Community, Pingshan Street, Pingshan New District,
Shenzhen, China

EUT Description: 37 inch Bluetooth Soundbar with Wireless Subwoofer

Model Number: MSB3787W, SBB-91460, SBB-XXXX(XXXX where X can be 0-9, A-Z)
(Note: These models are identical in circuitry and electrical, mechanical and physical
construction; the differences are the color and model no. for trading purpose. We
prepare MSB3787W for test.)

Trade Mark: Monster



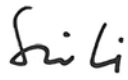
Measurement Procedure Used:

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC 47 CFR Part 2, Subpart J FCC 47 CFR Part 15, Subpart C	PASS

The above equipment was tested by EMTEK (SHENZHEN) CO., LTD.. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 2 and Part 15.249

The test results of this report relate only to the tested sample identified in this report.

Date of Test : September 25, 2019 to November 05, 2019

Prepared by : 
Sevin Li/Editor

Reviewer : 
Joe Xia/Supervisor

Approve & Authorized Signer : 
Lisa Wang/Manager



2 EUT TECHNICAL DESCRIPTION

Characteristics	Description
Modulation:	FSK
Operating Frequency Range(s):	910MHz – 919.5MHz
Number of Channels:	20 channels
Channel space:	500kHz
Antenna Type :	Wire Antenna
Antenna Gain:	0 dBi
Power supply:	☒ DC 24V from Adapter
	☒ Adapter: Model: JY048240200BA-UL Input: 100-240V~50/60Hz, 1.8A Max Output: 24V/2.0A

Note: for more details, please refer to the User's manual of the EUT.

3 SUMMARY OF TEST RESULT

FCC Part Clause	Test Parameter	Verdict	Remark
15.207	Conducted Emission	Pass	
15.205 15.209 15.249	Radiated Emission & Band edge test	Pass	
15.249	20dB Bandwidth	Pass	
15.203	Antenna Requirement	Pass	
NOTE1: N/A (Not Applicable) NOTE2: The report use radiated measurements in the restricted frequency bands. In addition, the radiated test is also performed to ensure the emissions emanating from the device cabinet also comply with the applicable limits.			

RELATED SUBMITTAL(S) / GRANT(S):

This submittal(s) (test report) is intended for FCC ID: OKUSBB91460 filing to comply with Section 15.249 of the FCC Part 15, Subpart C Rules.
 The system is compliance with Subpart B is authorized under a DOC procedure

4 TEST METHODOLOGY

4.1 GENERAL DESCRIPTION OF APPLIED STANDARDS

According to its specifications, the EUT must comply with the requirements of the following standards:
FCC 47 CFR Part 2, Subpart J
FCC 47 CFR Part 15, Subpart C

4.2 MEASUREMENT EQUIPMENT USED

4.2.1 Conducted Emission Test Equipment

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.
Test Receiver	Rohde & Schwarz	ESCI	101384	05/19/2019
AMN	Rohde & Schwarz	ENV216	101161	05/18/2019

4.2.2 Radiated Emission Test Equipment

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.
EMI Test Receiver	R & S	ESU 26	100154	05/19/2019
Pre-Amplifier	HP	8447F	2944A07999	05/19/2019
Pre-Amplifier	Lunar EM	LNA1G18-48	J101113101000 1	05/18/2019
Bilog Antenna	Schwarzbeck	VULB9163	660	07/14/2019
Loop Antenna	Schwarzbeck	FMZB1519	1519-012	07/14/2019
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1198	06/16/2019
Cable	Schwarzbeck	AK9513	ACRX1	05/18/2019
Cable	Rosenberger	N/A	FP2RX2	05/18/2019
Cable	Schwarzbeck	AK9513	CRPX1	05/18/2019
Cable	Schwarzbeck	AK9513	CRRX2	05/18/2019
Cable	H+B	0.5M SF104-26.5	289147/4	05/18/2019
Cable	H+B	3M SF104-26.5	295838/4	05/18/2019
Cable	H+B	6M SF104-26.5	295840/4	05/18/2019

4.2.3 Radio Frequency Test Equipment

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.
Power meter	Anritsu	ML2495A	0824006	05/18/2019
Power sensor	Anritsu	MA2411B	0738172	05/18/2019
Spectrum Analyzer	Agilent	N9010A	My53470879	05/19/2019
Spectrum Analyzer	R & S	FSV30	103039	05/19/2019
Spectrum Analyzer	R & S	FSV40	100967	05/19/2019
Power Splitter	Mini-Circuits	ZX10-2-183-S+	/	05/19/2019
Attenuator	Weinschel Associates	WA14	18-10-12	05/19/2019
Thermometer	Hegao	HTC-1	/	03/14/2019
Temp. / Humidity Chamber	ESPEC	EL-02KA	12107166	05/18/2019

Remark: Each piece of equipment is scheduled for calibration once a year.

4.3 DESCRIPTION OF TEST MODES

The EUT has been tested under its typical operating condition.

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

Test of channel included the lowest and middle and highest frequency to perform the test, then record on this report.

Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

☒ Frequency and Channel list:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	910.0	08	913.5	15	917.0
02	910.5	09	914.0	16	917.5
03	911.0	10	914.5	17	918.0
04	911.5	11	915.0	18	918.5
05	912.0	12	915.5	19	919.0
06	912.5	13	916.0	20	919.5
07	913.0	14	916.5		

☒ Test Frequency and Channel list:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	910.0	11	915.0	20	919.5

5 FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

Bldg 69, Majialong Industry Zone District, Nanshan District, Shenzhen, China

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 and CISPR Publication 22.

5.2 LABORATORY ACCREDITATIONS AND LISTINGS

Site Description

EMC Lab.

- : Accredited by CNAS, 2016.10.24
The certificate is valid until 2022.10.28
The Laboratory has been assessed and proved to be in compliance with CNAS-CL01: 2006(identical to ISO/IEC17025: 2017)
The Certificate Registration Number is L2291
- : Accredited by TUV Rheinland Shenzhen, 2018.3.30
The Laboratory has been assessed according to the requirements ISO/IEC 17025.
- : Accredited by FCC, August 06, 2018
The certificate is valid until August 07, 2020
Designation Number: CN1204
Test Firm Registration Number: 882943
- : Accredited by Industry Canada, November 09, 2018
The Conformity Assessment Body Identifier is CN0008.

6 TEST SYSTEM UNCERTAINTY

The following measurement uncertainty levels have been estimated for tests performed on the apparatus:

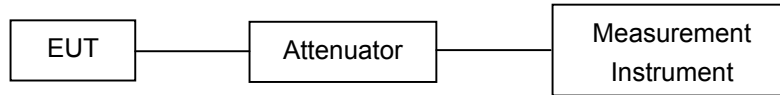
Parameter	Uncertainty
Radio Frequency	$\pm 1 \times 10^{-5}$
Maximum Peak Output Power Test	$\pm 1.0\text{dB}$
Conducted Emissions Test	$\pm 2.0\text{dB}$
Radiated Emission Test	$\pm 2.0\text{dB}$
Power Density	$\pm 2.0\text{dB}$
Occupied Bandwidth Test	$\pm 1.0\text{dB}$
Band Edge Test	$\pm 3\text{dB}$
All emission, radiated	$\pm 3\text{dB}$
Antenna Port Emission	$\pm 3\text{dB}$
Temperature	$\pm 0.5^{\circ}\text{C}$
Humidity	$\pm 3\%$

Measurement Uncertainty for a level of Confidence of 95%

7 SETUP OF EQUIPMENT UNDER TEST

7.1 RADIO FREQUENCY TEST SETUP 1

The Z-WAVE component's antenna ports(s) of the EUT are connected to the measurement instrument per an appropriate attenuator. The EUT is controlled by PC/software/itself to emit the specified signals for the purpose of measurements.



7.2 RADIO FREQUENCY TEST SETUP 2

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10. The test distance is 3m. The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 and CAN/CSA-CEI/IEC CISPR 22.

Below 30MHz:

The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna (loop antenna). The Antenna should be positioned with its plane vertical at the specified distance from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. The center of the loop shall be 1 m above the ground. For certain applications, the loop antenna plane may also need to be positioned horizontally at the specified distance from the EUT.

Above 30MHz:

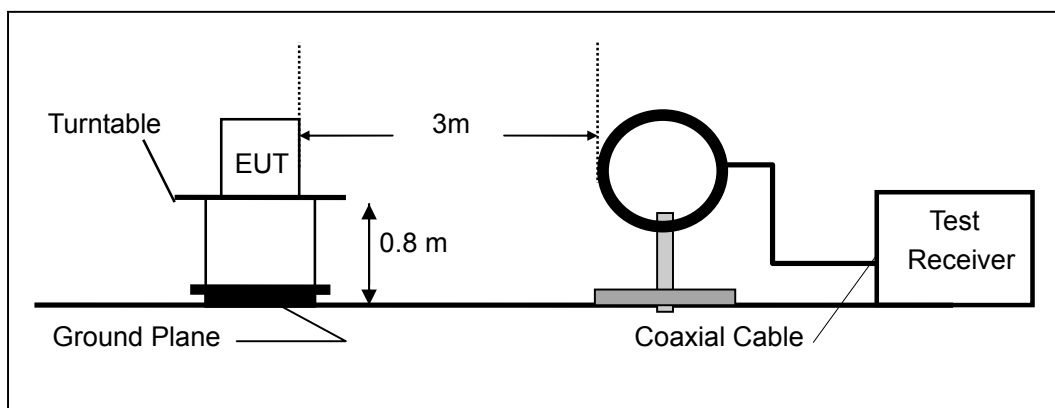
The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

Above 1GHz:

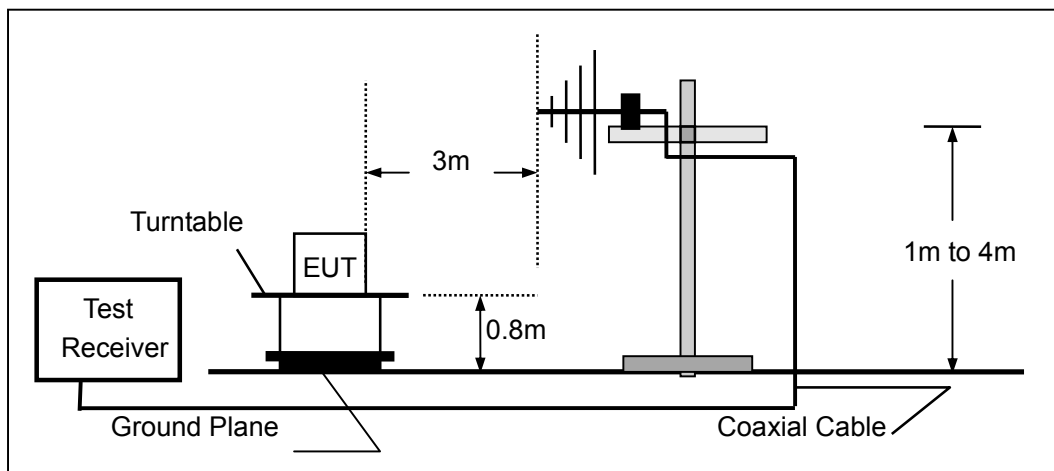
(Note: the FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 2, 2014.)

The EUT is placed on a turntable 1.5 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

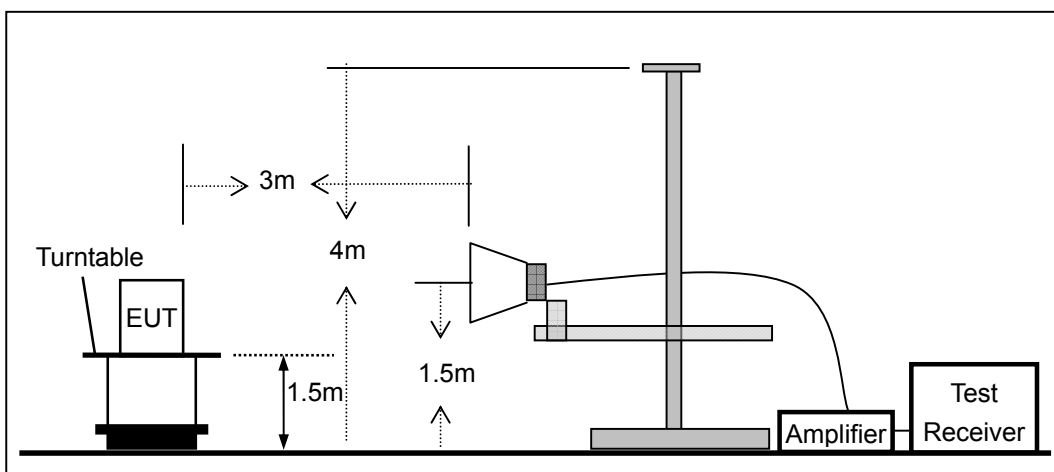
(a) Radiated Emission Test Set-Up, Frequency Below 30MHz



(b) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(c) Radiated Emission Test Set-Up, Frequency above 1000MHz

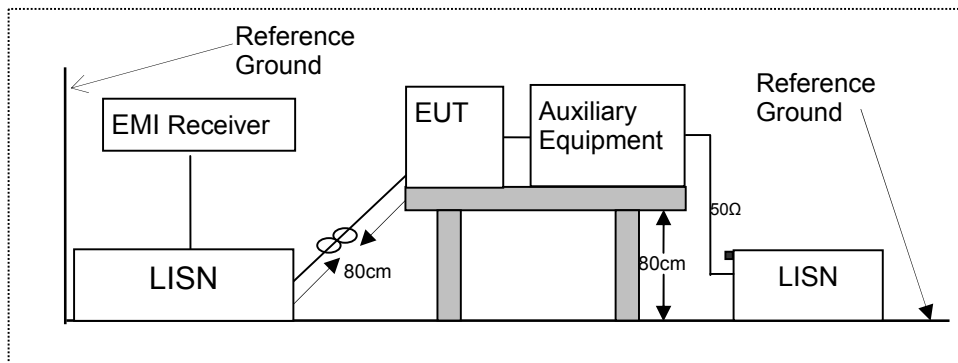


7.3 CONDUCTED EMISSION TEST SETUP

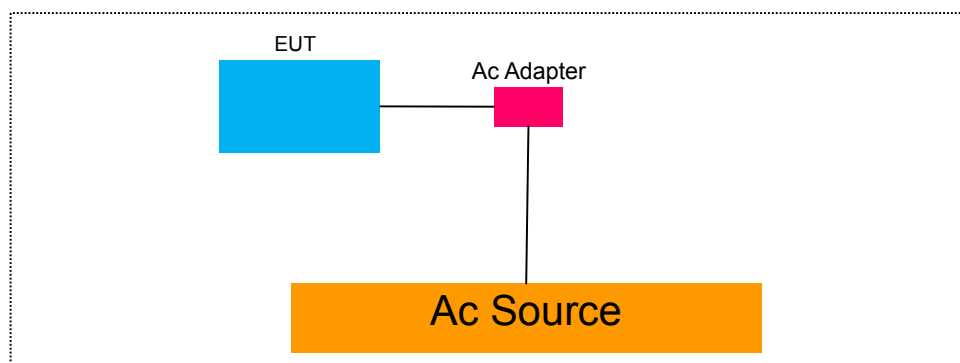
The mains cable of the EUT (maybe per AC/DC Adapter) must be connected to LISN. The LISN shall be placed 0.8 m from the boundary of EUT and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance is between the closest points of the LISN and the EUT. All other units of the EUT and associated equipment shall be at least 0.8m from the LISN.

Ground connections, where required for safety purposes, shall be connected to the reference ground point of the LISN and, where not otherwise provided or specified by the manufacturer, shall be of same length as the mains cable and run parallel to the mains connection at a separation distance of not more than 0.8 m.

According to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode.



7.4 BLOCK DIAGRAM CONFIGURATION OF TEST SYSTEM



7.5 SUPPORT EQUIPMENT

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Note
N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

8 TEST REQUIREMENTS

8.1 BANDWIDTH TEST

8.1.1 Applicable Standard

According to FCC Part 15.249

8.1.2 Conformance Limit

N/A

8.1.3 Test Configuration

Test according to clause 7.1 radio frequency test setup

8.1.4 Test Procedure

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.

Set to the maximum power setting and enable the EUT transmit continuously

Set RBW = 1% to 5% of the anticipated emission bandwidth

Set the video bandwidth (VBW) = 3×RBW

Set Span= approximately 2 to 3 times the 20 dB bandwidth

Set Detector = Peak.

Set Trace mode = max hold.

Set Sweep = auto couple.

Allow the trace to stabilize.

X dB Bandwidth: 20 dB

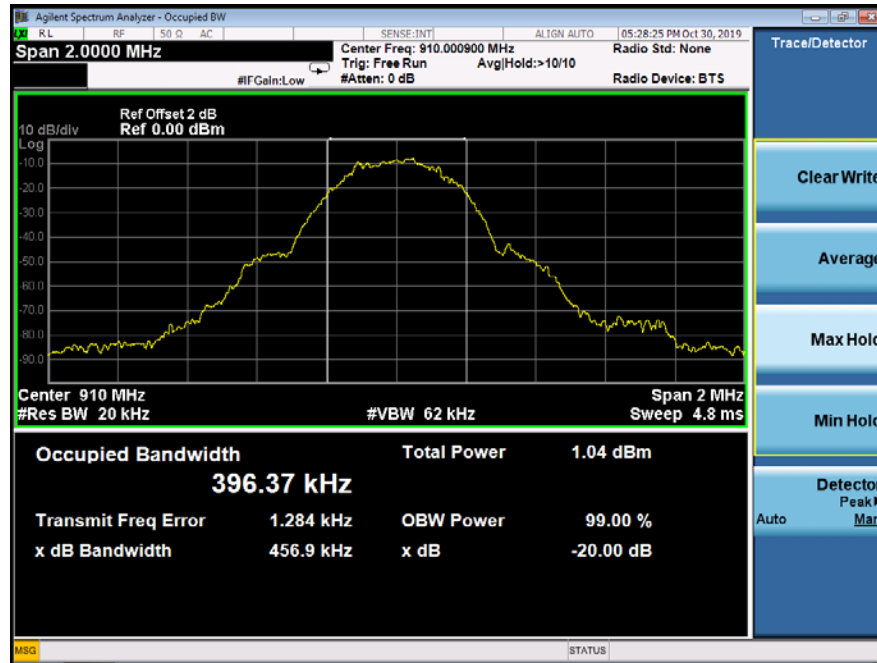
Note: The automatic bandwidth measurement capability of a spectrum analyzer or EMI receiver may be employed if it implements the functionality described above.

8.1.5 Test Results

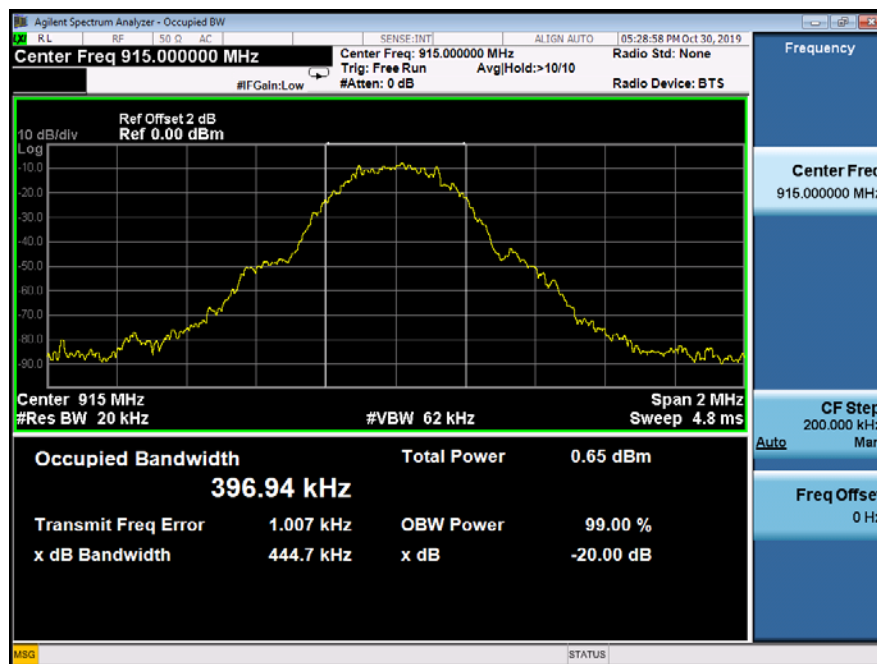
Temperature :	24℃	Test By:	Xuwei
Humidity :	65 %		

Operation Mode	Channel Number	Channel Frequency (MHz)	20dB Bandwidth (KHz)	Limit (kHz)
FSK	01	910.0	456.9	N/A
	11	915.0	444.7	N/A
	20	919.5	468.0	N/A

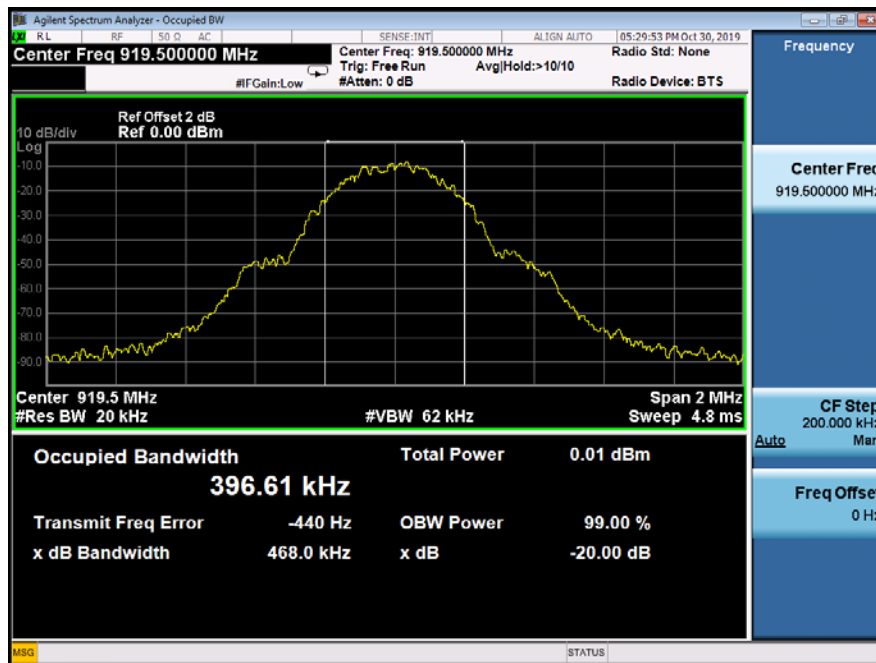
Test Model 20 Bandwidth Test
910MHz



Test Model 20 Bandwidth Test
915MHz



Test Model	20 Bandwidth Test
	915MHz



8.2 RADIATED SPURIOUS EMISSION

8.2.1 Applicable Standard

According to FCC Part 15.249, 15.209 and 15.205.

8.2.2 Conformance Limit

According to FCC Part 15.249: radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

According to FCC Part 15.205, Restricted bands

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
10.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(2)
13.36-13.41			

According to FCC Part 15.205, the level of any transmitter spurious emission in Restricted bands shall not exceed the level of the emission specified in the following table

Restricted Frequency(MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)	Measurement Distance
0.009-0.490	2400/F(KHz)	20 log (uV/m)	300
0.490-1.705	2400/F(KHz)	20 log (uV/m)	30
1.705-30	30	29.5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

Remark :1. Emission level in dBuV/m=20 log (uV/m)

2. Measurement was performed at an antenna to the closed point of EUT distance of meters.

3. Distance extrapolation factor =40log(Specific distance/ test distance)(dB);

Limit line=Specific limits(dBuV) + distance extrapolation factor.

for the frequency ranges below 30 MHz, a narrower RBW is used for these ranges but the measured value should add a RBW correction factor (RBWCF) where RBWCF [dB] =10*lg(100 [kHz]/narrower RBW [kHz]). , the narrower RBW is 1 kHz and RBWCF is 20 dB for the frequency 9 kHz to 150 kHz, and the narrower RBW is 10 kHz and RBWCF is 10 dB for the frequency 150 kHz to 30 MHz.

Field strength of fundamental and Field strength of harmonics Limit:

Fundamental frequency	Field strength of fundamental (millivolts/meter)	Field strength of harmonics (microvolts/meter)
902-928 MHz	50(94 dBV/m)	500(54 dBV/m)
2400-2483.5 MHz	50(94 dBV/m)	500(54 dBV/m)
5725-5875 MHz	50(94 dBV/m)	500(54 dBV/m)
24.0-24.25 GHz	250(108 dBV/m)	2500(68 dBV/m)

8.2.3 Test Configuration

Test according to clause 7.2 radio frequency test setup

8.2.4 Test Procedure

This test is required for any spurious emission that falls in a Restricted Band, as defined in Section 15.205. It must be performed with the highest gain of each type of antenna proposed for use with the EUT. Use the following spectrum analyzer settings:

For Above 1GHz:

The EUT was placed on a turn table which is 1.5m above ground plane.

Maximum procedure was performed on the highest emissions to ensure EUT compliance.

Span = wide enough to fully capture the emission being measured

RBW = 1 MHz

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

For Below 1GHz:

The EUT was placed on a turn table which is 0.8m above ground plane.

Maximum procedure was performed on the highest emissions to ensure EUT compliance.

Span = wide enough to fully capture the emission being measured

RBW = 100 kHz for

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

For Below 30MHz:

The EUT was placed on a turn table which is 0.8m above ground plane.

Maximum procedure was performed on the highest emissions to ensure EUT compliance.

Span = wide enough to fully capture the emission being measured

RBW = 9kHz

VBW $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

For Below 150KHz:

The EUT was placed on a turn table which is 0.8m above ground plane.

Maximum procedure was performed on the highest emissions to ensure EUT compliance.

Span = wide enough to fully capture the emission being measured

RBW = 200Hz

VBW $\geq$ RBW

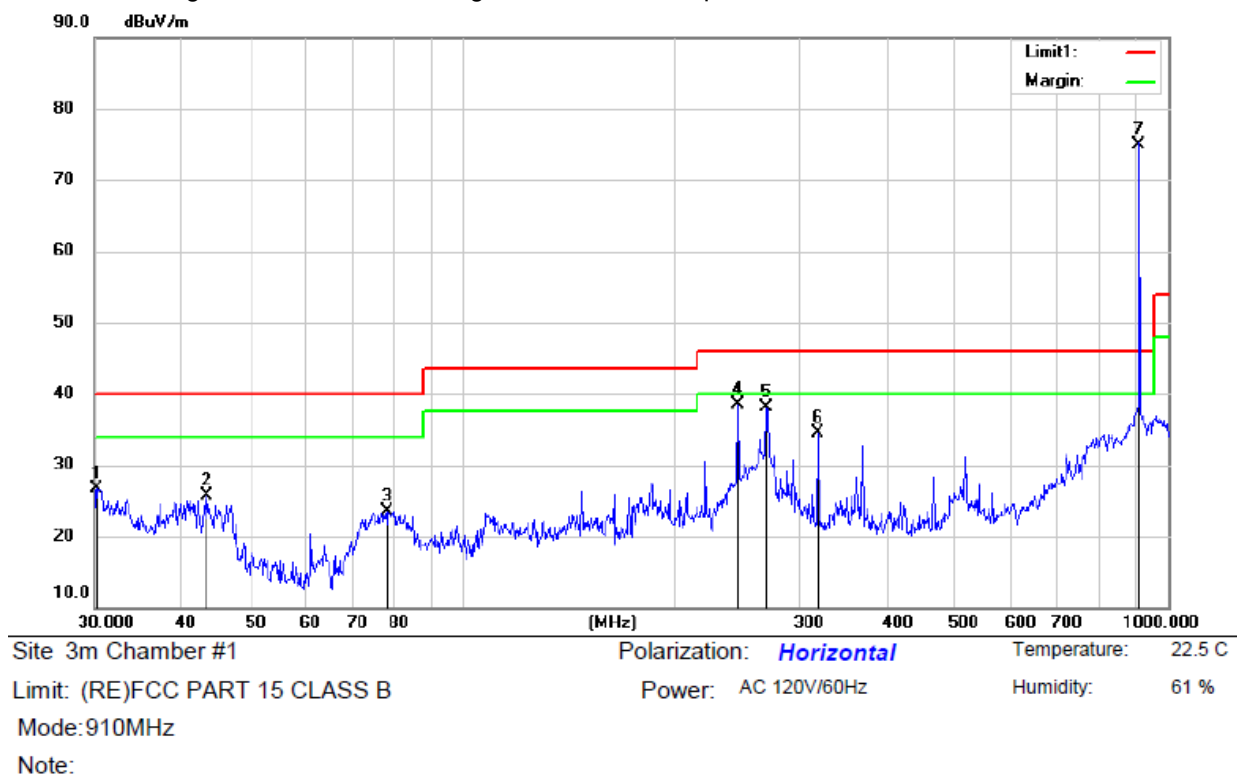
Sweep = auto

Detector function = peak

Trace = max hold

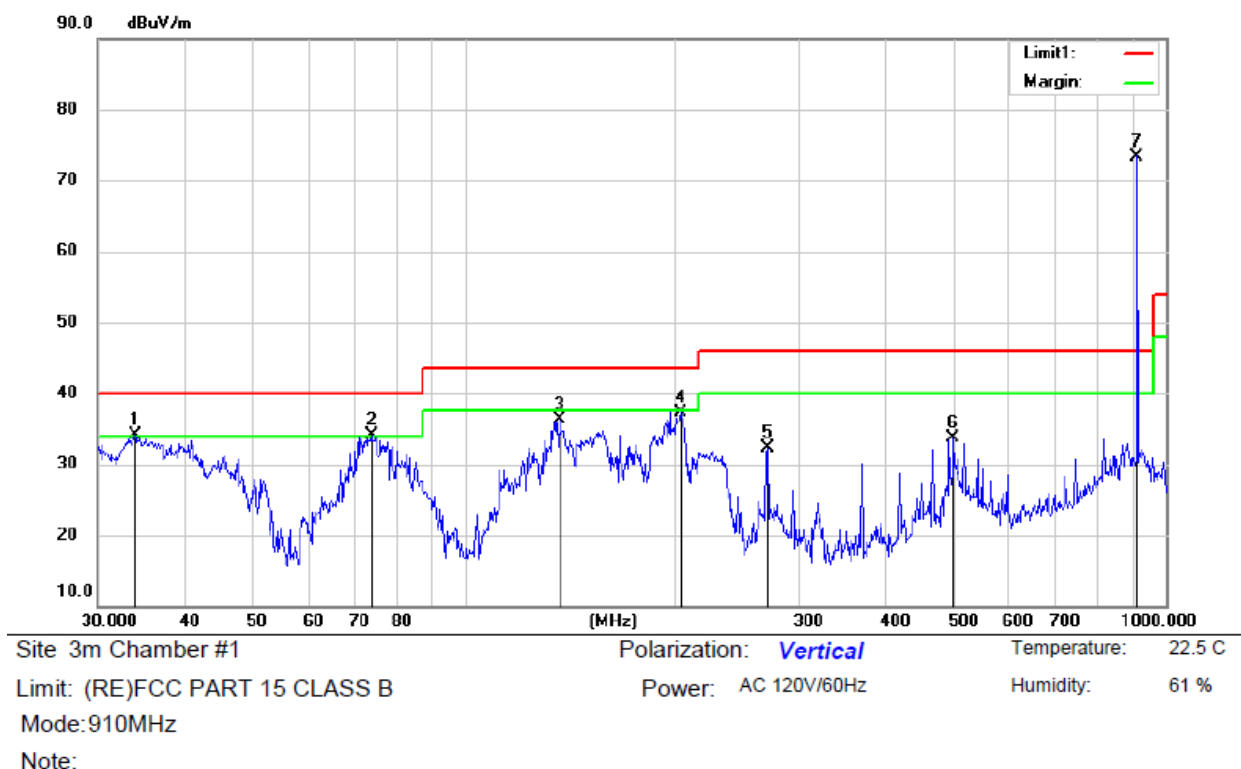
Follow the guidelines in ANSI C63.10-2013 with respect to maximizing the emission by rotating the EUT,

■ Field Strength of the fundamental signal and Radiated spurious emission 30MHz to 1GHz



*:Maximum data x:Over limit !:over margin

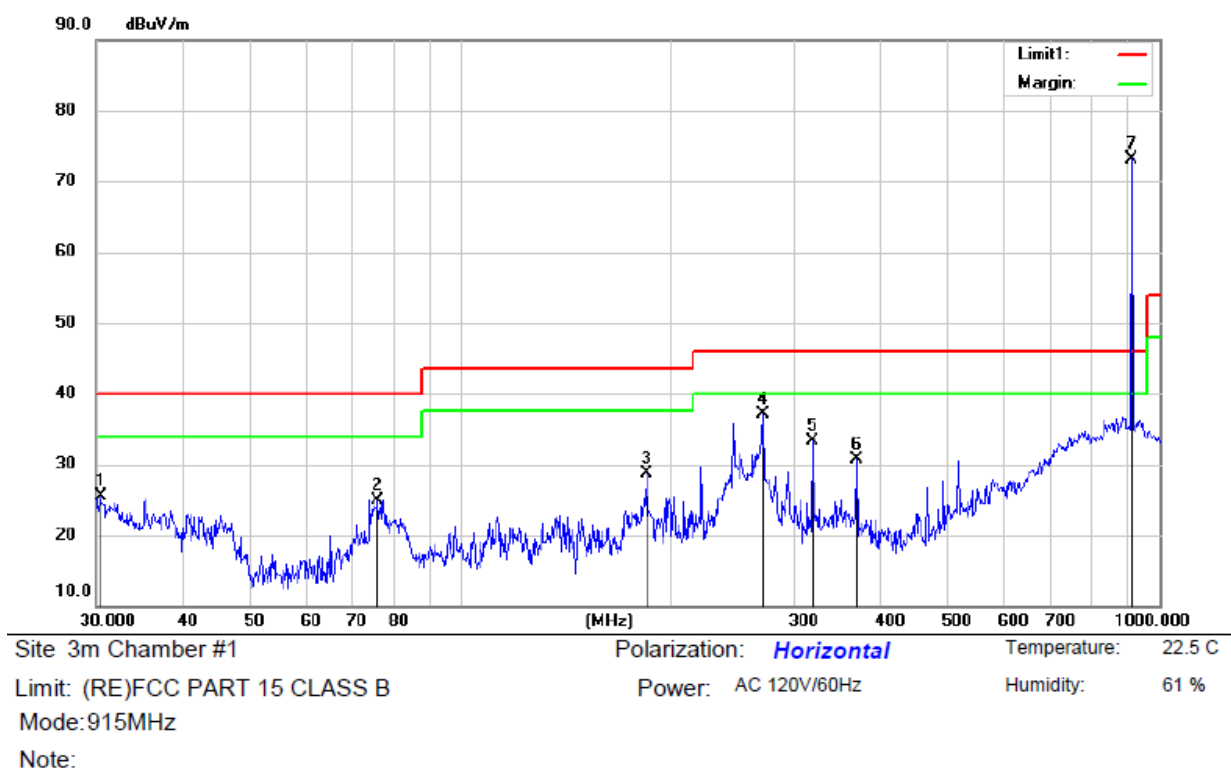
Operator: KK



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
		MHz	Level	Factor	ment			Height	Degree	
			dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1	!	33.9410	49.82	-15.79	34.03	40.00	-5.97	QP		
2	!	73.6684	51.44	-17.41	34.03	40.00	-5.97	QP		
3		136.6031	53.20	-16.97	36.23	43.50	-7.27	QP		
4		203.8083	50.53	-13.28	37.25	43.50	-6.25	QP		
5		270.3747	43.70	-11.50	32.20	46.00	-13.80	QP		
6		498.2003	40.18	-6.52	33.66	46.00	-12.34	QP		
7	*	910.0220	72.51	0.89	73.40	94.00	-20.60	QP		

*:Maximum data x:Over limit !:over margin

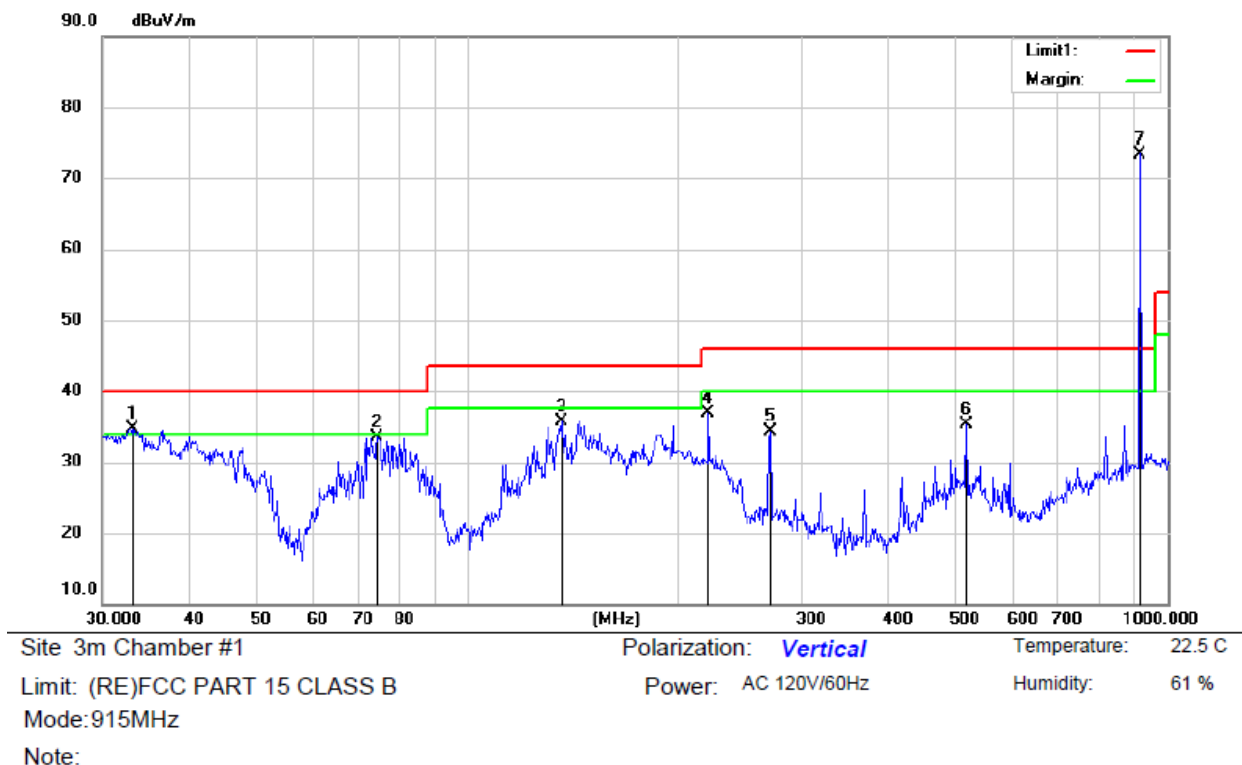
Operator: KK



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		30.4450	41.50	-16.05	25.45	40.00	-14.55	QP		
2		75.9770	42.72	-17.74	24.98	40.00	-15.02	QP		
3		184.6840	43.81	-15.10	28.71	43.50	-14.79	QP		
4		270.3747	48.60	-11.50	37.10	46.00	-8.90	QP		
5		319.4884	43.84	-10.58	33.26	46.00	-12.74	QP		
6		368.6283	39.84	-9.08	30.76	46.00	-15.24	QP		
7	*	915.0472	72.30	0.90	73.20	94.00	-20.80	QP		

*:Maximum data x:Over limit !:over margin

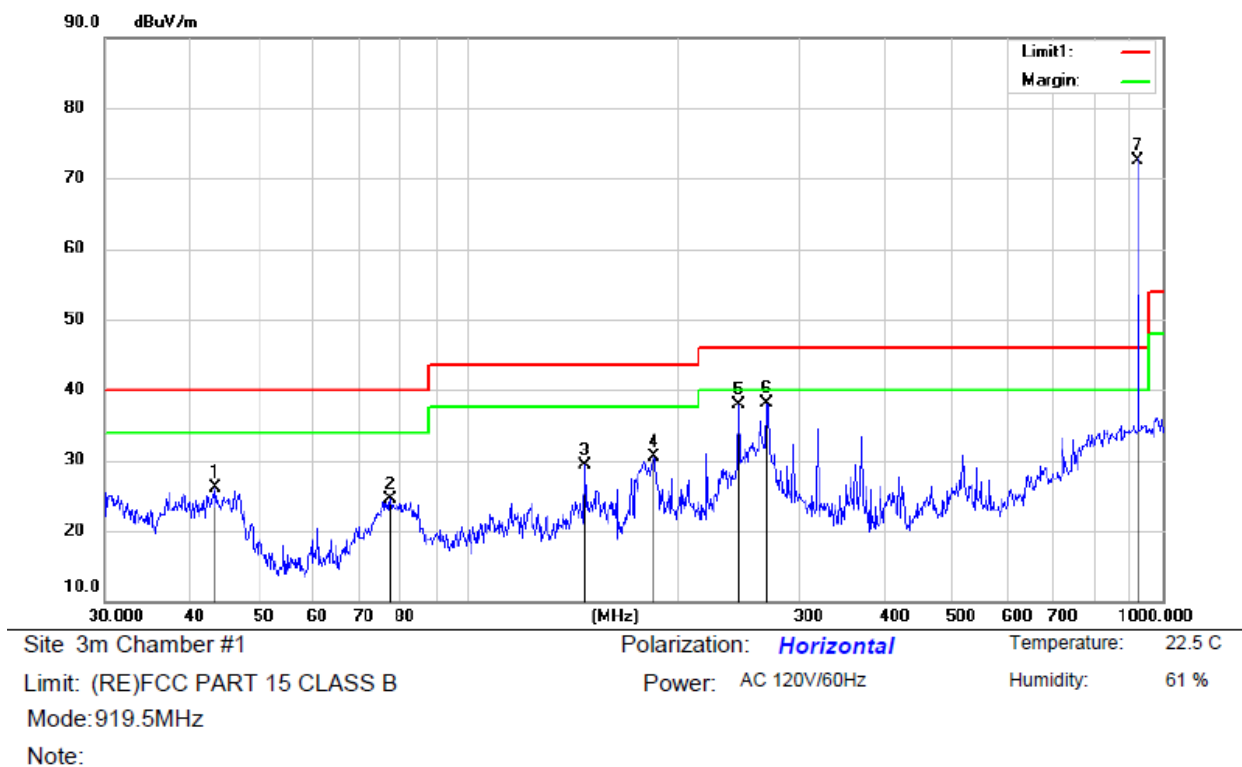
Operator: KK



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Antenna Height cm	Table Degree degree	Comment
1	!	33.2344	50.62	-15.93	34.69	40.00	-5.31	QP		
2		74.2912	50.96	-17.48	33.48	40.00	-6.52	QP		
3		136.4120	52.61	-16.96	35.65	43.50	-7.85	QP		
4		221.2367	50.15	-13.20	36.95	46.00	-9.05	QP		
5		270.3747	45.81	-11.50	34.31	46.00	-11.69	QP		
6		516.1607	40.99	-5.74	35.25	46.00	-10.75	QP		
7	*	915.0472	72.40	0.90	73.30	94.00	-20.70	QP		

*:Maximum data x:Over limit !:over margin

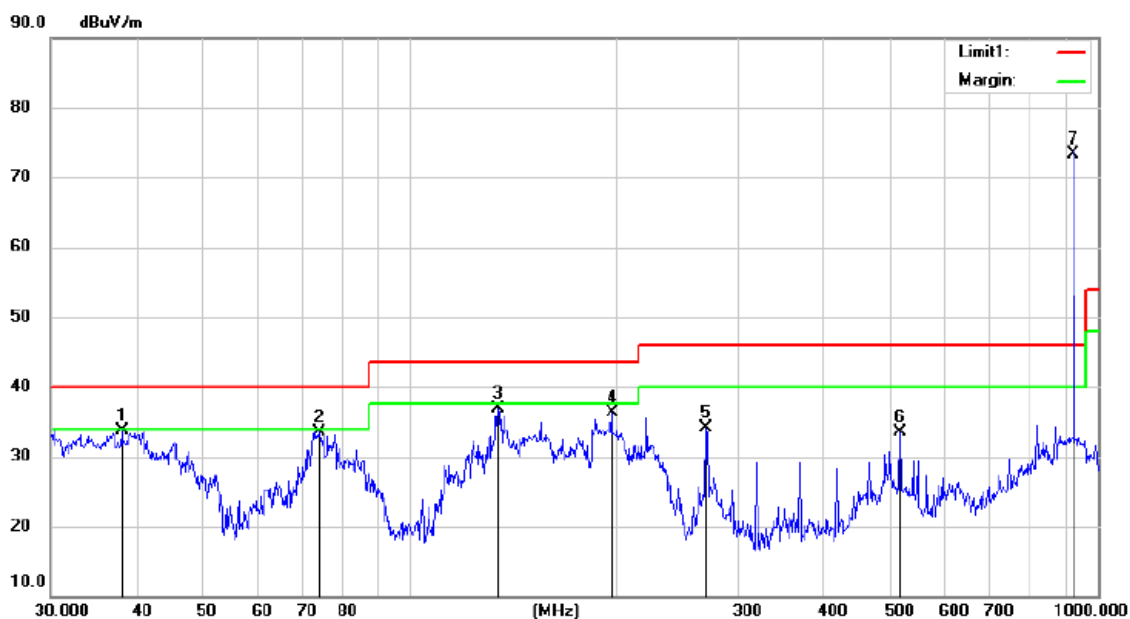
Operator: KK



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
		MHz	Level	Factor	ment			Height	Degree	
			dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree
1		43.4446	40.30	-14.15	26.15	40.00	-13.85	QP		
2		77.4840	42.46	-17.99	24.47	40.00	-15.53	QP		
3		147.5586	47.00	-17.65	29.35	43.50	-14.15	QP		
4		185.3976	45.56	-14.97	30.59	43.50	-12.91	QP		
5		245.7785	50.66	-12.70	37.96	46.00	-8.04	QP		
6		270.2800	49.53	-11.50	38.03	46.00	-7.97	QP		
7	*	919.5057	71.67	0.93	72.60	94.00	-21.40	QP		

*:Maximum data x:Over limit !:over margin

Operator: KK



Site 3m Chamber #1

Polarization: Vertical

Temperature: 22.5 C

Limit: (RE)FCC PART 15 CLASS B

Power: AC 120V/60Hz

Humidity: 61 %

Mode: 919.5MHz

Note:

No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
		MHz	Level	Factor	ment			Height	Degree	
			dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		38.0915	48.51	-14.75	33.76	40.00	-6.24	QP		
2		73.6684	50.94	-17.41	33.53	40.00	-6.47	QP		
3		134.2290	53.52	-16.69	36.83	43.50	-6.67	QP		
4		196.5783	49.89	-13.65	36.24	43.50	-7.26	QP		
5		270.2800	45.69	-11.50	34.19	46.00	-11.81	QP		
6		516.1607	39.24	-5.74	33.50	46.00	-12.50	QP		
7	*	919.5092	72.47	0.93	73.40	94.00	-20.60	QP		

*:Maximum data x:Over limit !:over margin

Operator: KK

■ Spurious Emission Above 1GHz(1GHz to 25GHz)

Temperature:	24℃	Test By:	Xuwei
Humidity:	53 %	Frequency:	910.0 MHz
Test mode:	FSK		

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
1820.00	V	57.85	47.02	74.00	54.00	-16.15	-6.98
2730.00	V	54.11	43.98	74.00	54.00	-19.89	-10.02
6479.74	V	55.05	39.55	74.00	54.00	-18.95	-14.45
1820.00	H	56.88	46.74	74.00	54.00	-17.12	-7.26
2730.00	H	53.72	43.51	74.00	54.00	-20.28	-10.49
5628.28	H	56.14	39.48	74.00	54.00	-17.86	-14.52

Temperature:	24℃	Test By:	Xuwei
Humidity:	53 %	Frequency:	915.0 MHz
Test mode:	FSK		

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
1830.00	V	58.02	47.23	74.00	54.00	-15.98	-6.77
2745.00	V	54.52	44.32	74.00	54.00	-19.48	-9.68
6382.76	V	56.07	39.54	74.00	54.00	-17.93	-14.46
1820.00	H	57.62	46.77	74.00	54.00	-16.38	-7.23
2730.00	H	52.69	43.05	74.00	54.00	-21.31	-10.95
5938.90	H	55.98	40.02	74.00	54.00	-18.02	-13.98

Temperature:	24℃	Test By:	Xuwei
Humidity:	53 %	Frequency:	919.5 MHz
Test mode:	FSK		

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
1839.00	V	57.48	46.95	74.00	54.00	-16.52	-7.05
2758.50	V	53.74	43.62	74.00	54.00	-20.26	-10.38
6325.79	V	57.22	39.25	74.00	54.00	-16.78	-14.75
1820.00	H	58.02	47.24	74.00	54.00	-15.98	-6.76
2730.00	H	53.13	42.99	74.00	54.00	-20.87	-11.01
6249.88	H	55.87	39.61	74.00	54.00	-18.13	-14.39

- Note:** (1) All Readings are Peak Value (VBW=3MHz) and Average Value=Peak Value + Duty Cycle Correction Factor(dB)
(2) Emission Level= Reading Level+Probe Factor +Cable Loss.
(3) Data of measurement within this frequency range shown “ -- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

■ Radiation Band Edge

Temperature: 24℃
Humidity: 53 %
Test mode: FSK

Test By: Xuwei
Frequency: 910.0 MHz

Freq. (MHz)	Ant.Pol. H/V	Reading Level (dBuV)	Factor (dB)	Measurement (dBuV/m)	Limit (dBuV/m)	Over(dB)	Detector
902.00	V	32.53	0.72	33.25	46.00	-12.75	QP
902.00	H	32.86	0.72	33.58	46.00	-12.16	QP

Temperature: 24℃
Humidity: 53 %
Test mode: FSK

Test By: Xuwei
Frequency: 919.5 MHz

Freq. (MHz)	Ant.Pol. H/V	Reading Level (dBuV)	Factor (dB)	Measurement (dBuV/m)	Limit (dBuV/m)	Over(dB)	Detector
928.00	V	33.23	0.98	34.21	46.00	-11.79	QP
928.00	H	32.86	0.98	33.84	46.00	-12.16	QP

8.3 CONDUCTED EMISSIONS TEST

8.3.1 Applicable Standard

According to FCC Part 15.207(a)

8.3.2 Conformance Limit

Conducted Emission Limit		
Frequency(MHz)	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50
Note: 1. The lower limit shall apply at the transition frequencies 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.		

8.3.3 Test Configuration

Test according to clause 7.3 conducted emission test setup

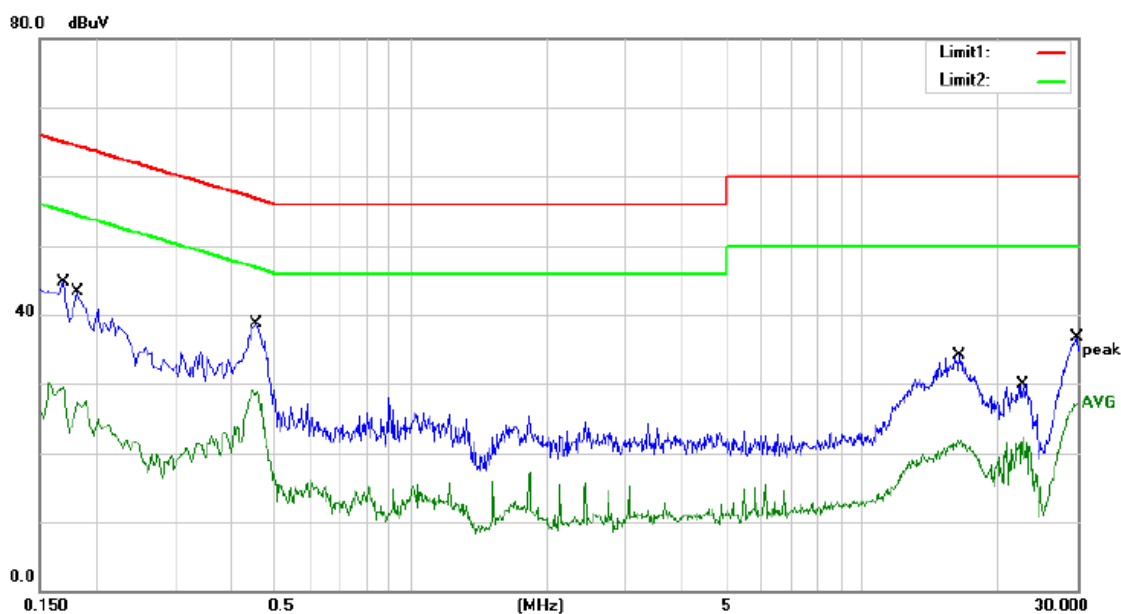
8.3.4 Test Procedure

The EUT was placed on a table which is 0.8m above ground plane.
Maximum procedure was performed on the highest emissions to ensure EUT compliance.
Repeat above procedures until all frequency measured were complete.

8.3.5 Test Results

Pass

We test the EUT at 120V and 240V, and show the worst result as bellow.



Site Conduction #1

Phase: **N**

Temperature: 25.4

Limit: (CE)FCC PART 15 class B_QP

Power: AC 120V/60Hz

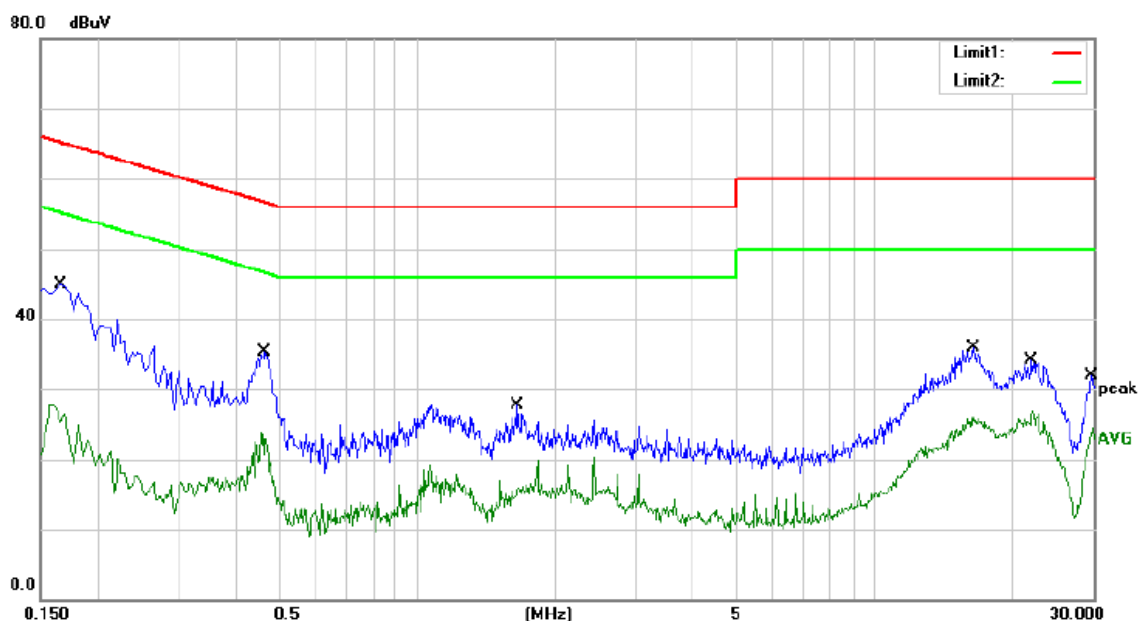
Humidity: 54 %

Mode: 910MHz

Note:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1700	35.14	9.55	44.69	64.96	-20.27	QP	
2		0.1700	20.57	9.55	30.12	54.96	-24.84	AVG	
3		0.1820	33.65	9.55	43.20	64.39	-21.19	QP	
4		0.1820	17.94	9.55	27.49	54.39	-26.90	AVG	
5		0.4540	29.20	9.56	38.76	56.80	-18.04	QP	
6	*	0.4540	19.59	9.56	29.15	46.80	-17.65	AVG	
7		16.4380	24.11	10.07	34.18	60.00	-25.82	QP	
8		16.4380	11.89	10.07	21.96	50.00	-28.04	AVG	
9		22.7540	19.49	10.34	29.83	60.00	-30.17	QP	
10		22.7540	11.93	10.34	22.27	50.00	-27.73	AVG	
11		29.9180	26.43	10.31	36.74	60.00	-23.26	QP	
12		29.9180	16.84	10.31	27.15	50.00	-22.85	AVG	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: WQG



Site Conduction #1

Phase: **L1**

Temperature: 25.4

Limit: (CE)FCC PART 15 class B_QP

Power: AC 120V/60Hz

Humidity: 54 %

Mode: 910MHz

Note:

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1	*	0.1660	35.41	9.57	44.98	65.16	-20.18	QP	
2		0.1660	18.21	9.57	27.78	55.16	-27.38	AVG	
3		0.4660	25.84	9.56	35.40	56.58	-21.18	QP	
4		0.4660	14.30	9.56	23.86	46.58	-22.72	AVG	
5		1.6540	18.05	9.59	27.64	56.00	-28.36	QP	
6		1.6540	10.34	9.59	19.93	46.00	-26.07	AVG	
7		16.4180	25.80	10.06	35.86	60.00	-24.14	QP	
8		16.4180	15.81	10.06	25.87	50.00	-24.13	AVG	
9		21.9580	23.69	10.33	34.02	60.00	-25.98	QP	
10		21.9580	16.51	10.33	26.84	50.00	-23.16	AVG	
11		29.7220	21.61	10.31	31.92	60.00	-28.08	QP	
12		29.7220	14.12	10.31	24.43	50.00	-25.57	AVG	

*:Maximum data x:Over limit !:over margin Comment: Factor build in receiver. Operator: WQG

8.4 ANTENNA APPLICATION

8.4.1 Antenna Requirement

Standard	Requirement
FCC CRF Part 15.203	An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

8.4.2 Result

PASS.

The EUT has 1 antenna: Wire Antenna 0dBi.

Note: ☒ Antenna use a permanently attached antenna which is not replaceable.
☐ Not using a standard antenna jack or electrical connector for antenna replacement
☐ The antenna has to be professionally installed (please provide method of installation)

which in accordance to section 15.203, please refer to the internal photos.

-----THE END-----